SCIENCE

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THE TRIPP ANTI-FRICTION ROLLER-BEARING.

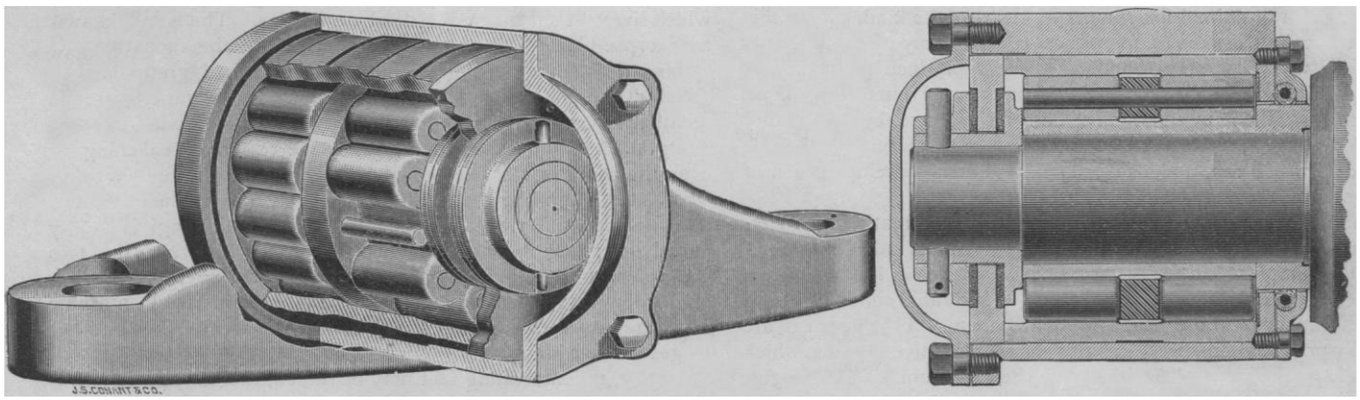
THIS bearing is adapted for use on car axles, dynamo-shafts, and similar places where there is high speed or heavy pressure, or both. It consists of a double set of rollers held in place by a sort of skeleton frame, and enclosed in a box of suitable construction. The rollers are of steel, of the same degree of hardness as when cut from the bar. They fit snugly around the shaft or axle, and bear against the inside of the box, revolving on their axes, and travelling around with the shaft, thus reducing the friction to almost zero, or, in other words, to rolling friction. Mr. J. A. Dyblie of the Chicago Arc Light and Power Company turned a six-inch shaft with his thumb and finger to and fro with the greatest ease.

The construction of the device may easily be understood by an inspection of the accompanying illustrations. Fig. 1 is a perspective view, with part of the outer shell or box broken away to show the interior, and one of the rollers removed to show the pin upon which it revolves. This pin, it must be remembered, performs no duty except to keep the roller in place when the shaft is removed, and to keep the roller in line with the shaft when in use. It bears no part of the weight of the shaft or axle, that all being transferred to the box by the rollers. Fig. 2 is a sectional view of the bearing, showing a very important feature; namely, the thrust-plate and collars, which take the end-thrust of the axle caused by the side-motion of the cars, as in going around a curve. This feature is shown at the left of the sectional view. The thrust-plate is bolted firmly to the box, and has two leatheroid collars — one on each side — between it and the thrust-collars, which latter are keyed to the end of the axle. This thrust-bearing has an area of sixty-three square inches, in contact at both ends of the car-axle, while that of the master car-builders' standard axle has an area of only seventeen square inches, in contact at only one end of the axle at a time.

It is stated, that, in a set of these bearings on a train running between Boston and Philadelphia, the rollers show a reduction in diameter of less than five one-thousandths of an inch, after a total service of forty-five thousand miles. They also remain uniform in size from end to end. This shows a very small amount of friction. Much of the long life of these rolls is doubtless due to the fact that the bearing is made dust-proof by a cap at one end and an expansive packing at the other, which, it is claimed, keep the lubricating material absolutely free from dust and water, so that it does not require renewal during the life of an ordinary chilled car-wheel.

Another advantage claimed is, that, when the brake is strongly applied, the strain comes on the rolls opposite the brake-shoe, causing no cramping, the axles turning as freely in the boxes as ever. In ordinary bearings the tendency is to crowd the journal out of the brasses, thereby reducing the bearing surface, inducing a tendency to heat when the journal returns to the centre of the box upon the release of the brake.

In a test of a two-inch journal in one of these bearings, under a pressure of four hundred pounds, without lubrication, it made a record of six thousand revolutions a minute for two hours without heating. Under a five-thousand-pound street-car, holding the regular number of passengers, a set of these bearings has been in use over two years with only one lubrication; and, though the car has been off the track the usual number of times, the bearings show no detrimental wear. They are now doing good service on about twenty street-cars, and are being applied to electric car-motors, stationary motors, shafting, and in various other places where a minimum of friction is desired.



ROLLER-BEARINGS FOR REDUCING FRICTION.

FUNGOUS DISEASES OF PLANTS.

VARIOUS rusts, smuts, mildews, blights, and similar diseases of cultivated plants, have been generally known and dreaded since plants began to be cultivated. Any understanding of the cause of these troubles, of the conditions of their occurrence, and of their relations to each other and to the plants they infest, is a matter of comparatively recent acquisition even among botanists. Among American farmers and gardeners it is only recently that intelligent inquiry and thought regarding these important sources of loss have been awakened, and they are but just beginning to be popularly spoken of as fungous diseases. With this increased popular interest has naturally arisen an increased interest in their scientific investigation, which is as yet but fairly begun, and in the practical application of our technical knowledge in devising ways and means for checking the spread and preventing the ravages of the pests.